

FIG. 1

$$H_3 = \begin{bmatrix} H_2 & H_2 \\ H_2 & \overline{H_2} \end{bmatrix}$$

COLUMN NUMBER								ROW NUMBER
000	001	010	011	100	101	110	111	
$\begin{pmatrix} 0 \\ 0 \end{pmatrix}$	$\begin{pmatrix} 0 \\ 1 \end{pmatrix}$	0	0	0	0	0	0	000
0	1	0	1	0	1	0	1	001
0	0	1	1	0	0	1	1	010
0	1	1	0	0	1	1	0	011
0	0	0	0	1	1	1	1	100
0	1	0	1	1	0	1	0	101
0	0	1	1	1	1	0	0	110
0	1	1	0	1	0	0	1	111

FIG. 2 (a)

ROW "001" COLUMN "000" VALUE OF ROW NUMBER "001"
CORRESPONDING TO COLUMN NUMBER "000"

$$\begin{aligned}
 & \downarrow \qquad \qquad \downarrow \\
 & 1 \text{ (0TH BIT VALUE)} \times 0 \text{ (0TH BIT VALUE)} + \\
 & 0 \text{ (1ST BIT VALUE)} \times 0 \text{ (1ST BIT VALUE)} + \\
 & 0 \text{ (2ND BIT VALUE)} \times 0 \text{ (2ND BIT VALUE)} = \underline{\underline{0}}
 \end{aligned}$$

FIG. 2 (b)

ROW "001" COLUMN "001" VALUE OF ROW NUMBER "001"
CORRESPONDING TO COLUMN NUMBER "001"

$$\begin{aligned}
 & \downarrow \qquad \qquad \downarrow \\
 & 1 \text{ (0TH BIT VALUE)} \times 1 \text{ (0TH BIT VALUE)} + \\
 & 0 \text{ (1ST BIT VALUE)} \times 0 \text{ (1ST BIT VALUE)} + \\
 & 0 \text{ (2ND BIT VALUE)} \times 0 \text{ (2ND BIT VALUE)} = \underline{\underline{1}}
 \end{aligned}$$

FIG. 2 (c)

ROW "abc" COLUMN "def" VALUE OF ROW NUMBER "abc"
CORRESPONDING TO COLUMN NUMBER "def"

$$\begin{aligned}
 & \downarrow \qquad \qquad \downarrow \\
 & c \text{ (0TH BIT VALUE)} \times f \text{ (0TH BIT VALUE)} + \\
 & b \text{ (1ST BIT VALUE)} \times e \text{ (1ST BIT VALUE)} + \\
 & a \text{ (2ND BIT VALUE)} \times d \text{ (2ND BIT VALUE)} = \underline{\underline{X}}
 \end{aligned}$$

FIG. 3

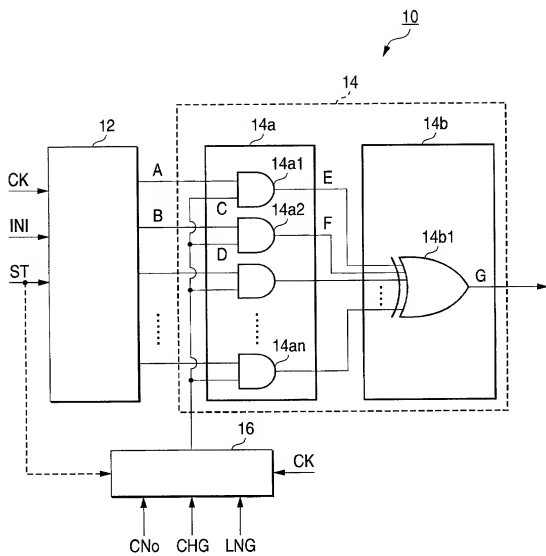


FIG. 4 (a)

	COLUMN NUMBER				ROW NUMBER OF HIERARCHICAL ORTHOGONAL CODE	ROW NUMBER OF HADAMARD MATRIX
	00	01	10	11		
$C_2(0)$	=	0	0	0	0	00
$C_2(1)$		0	0	1	1	10
$C_2(2)$		0	1	0	1	01
$C_2(3)$		0	1	1	0	11

FIG. 4 (b)

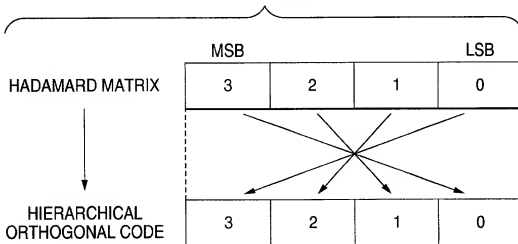


FIG. 5

									ROW NUMBER (CODE NUMBER)
$H_3 =$	0	0	0	0	0	0	0	0	000
	0	1	0	1	0	1	0	1	001
	0	0	1	1	0	0	1	1	010
	0	1	1	0	0	1	1	0	011
	0	0	0	0	1	1	1	1	100
	0	1	0	1	1	0	1	0	101
	0	0	1	1	1	1	0	0	110
	0	1	1	0	1	0	0	1	111

FIG. 6

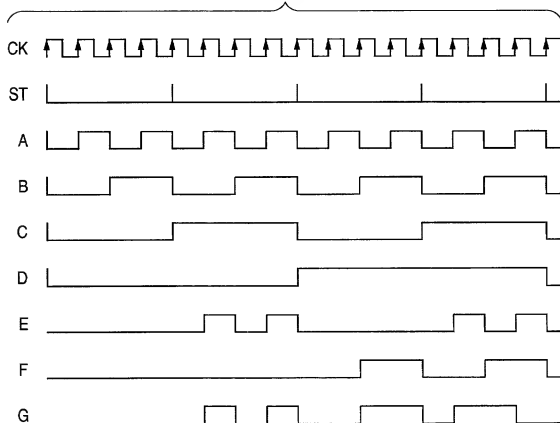


FIG. 7

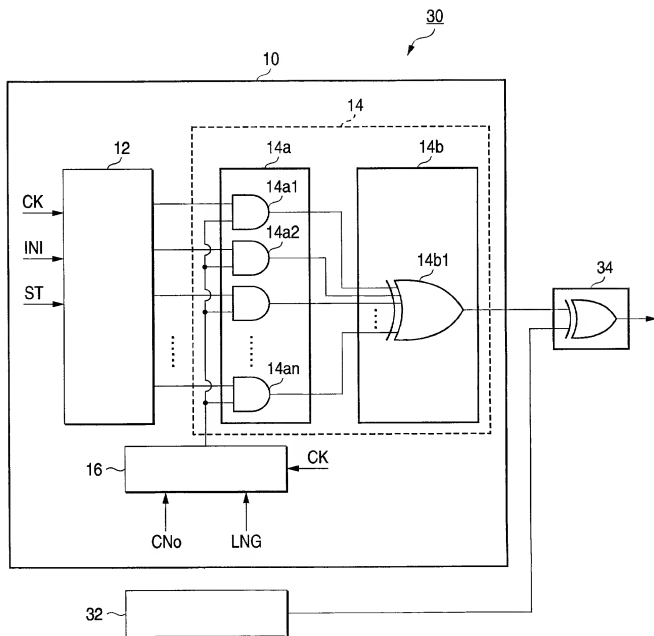


FIG. 8

								CODE NUMBER (ROW NUMBER)
$C_3 =$	0	0	0	0	0	0	0	000
	0	0	0	0	1	1	1	001
	0	0	1	1	0	0	1	010
	0	0	1	1	1	1	0	011
	0	1	0	1	0	1	0	100
	0	1	0	1	1	0	1	101
	0	1	1	0	0	1	1	110
	0	1	1	0	1	0	0	111

FIG. 9

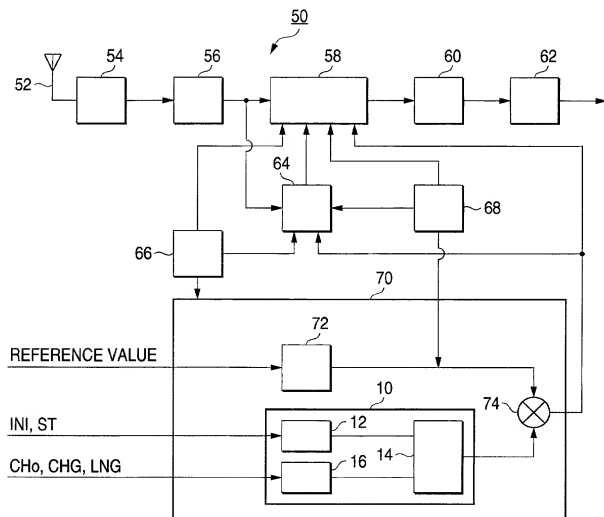


FIG. 10

